CENTRAL REGION INTEGRATED SCIENCE PARTNERSHIP FUNDS
FY 03 Project/Activity Status Report
Due: January 9, 2004

Date:	**January 9, 2004**
Project/Activity Title:	**Mancos Shale Landscapes**
Account Number:	**(8928OFC)**
Principal Investigator:	**Dick Grauch, Paul von Guerard, John Elliott, Geneva Chong, John Kosovich**
Partners/Collaborators and Affiliation:	**Karen Tucker, Jim Ferguson, Amanda Clements, Dennis Murphy/BLM**
Total Funding Approved:	**FY03 :~$68,000**
Total Expenditures:	**~$68,000**

Objective of Project/Activity: ***(****Provide short description of project/activity goals and list outcomes/products.****)***

Mission Statement

It is the mission of the BLM/USGS science team to develop, implement, and evaluate research that results in technical information, findings, techniques, and recommendations needed to support land use decisions in the Gunnison Gorge NCA. Equally important, is to develop a procedural model for widespread application that integrates the scientific skills of USGS scientists with resource manager knowledge to provide scientific information that is usable and relevant to priority land management issues.

Goals

Minimize the yield of salinity, sediment, and selenium into perennial waters of both the Uncompahgre or Gunnison Basins (off-site impacts).Minimize the amount of surface disturbance, water and wind erosion, soil compaction, and runoff especially on sensitive areas (e.g. plant and biological soil crust cover, wildlife habitats, etc. (on-site impacts).

Objective

To be able to convey to managers, land disturbance consequences for a spectrum of surface disturbing scenarios. The product to meet this objective would be a series of maps, graphics and tabular data. An additional, desirable aspect of the product from the Science Team, is that data updates should be easily factored in to the procedural model.

Project/Activity Accomplishments: *(What outcomes/products were achieved including what benefits were derived and by whom?****)***

All project members continued internal dialog on project activities and when appropriated met with various BLM counterparts to discuss activities and further our mutual understanding of respective needs and objectives. All activities are designed to produce basic data and/or an understanding of process that will (1) facilitate the development of scientifically defensible management decisions and (2) the transportability of concepts to other landscapes. The mission statement, goals and objective listed above were developed cooperatively with our BLM partners.

Landscape Classification, Erosion Processes, and Threshold Determination: Task Leader -- John G. Elliott, USGS WRD

- Conducted several rainfall simulation experiments in the Elephant Skin area of the GGNCA after designing and building the required hardware for the experiments. Initial results show unexpected variations in runoff and sediment yield as a function of slope. Differences between undisturbed and OHV-disturbed hill slopes are being evaluated.

- Follow-up discussions with BLM scientists in Montrose. On-site reconnaissance and selection of a few potential study sites in the GGNCA. Also visited the BLM's Fairview Natural Research Area with Jim Ferguson (BLM) and Jim Herring (USGS GD). On-site observation of soil structure and erosion characteristics in the GGNCA. Initial measurements of geomorphic variables at selected locations in the GGNCA. On-site verification and subsequent modification of GIS-derived watershed subbasins (Catts), known as Hydrologic Runoff Units (HRUs).
- Ongoing collaboration with Jon Kosovich (NMD) in the development of DEM data bases, maps, and visual products to be used in reconnaissance, geomorphic analyses, and as spatial and digital references for coordination of several other Tasks.

Mapping Discipline on Gunnison NCA/Mancos Shale: Task Leader – John Kosovich (formerly Dave Catts) USGS NMD (John officially took this position at the beginning of FY '04)

- Created perspective visualization of NCA and Mancos Shale contact for briefings
- Generated graphic of preliminary topographic indices of terrain
- Panelled National Diversity Information Source (NDIS) vegetation mapping for four primary watersheds
- Created graphic of panelled NDIS vegetation mapping and landscape visualization from NDIS vegetation mapping
- Integrated foliage specimens with NDIS landcover and National Land Cover Data (NLCD)
- Generated initial pediment topographic properties

Biological Resources Discipline on Gunnison NCA/Mancos Shale: Task Leader – Geneva Chong (formerly Steve Hamilton) USGS BRD

- Data Collected for the following: Species (native and non-native), Cover (species, abiotic, microbiotic crusts), Soils (texture, C (organic, inorganic), N), Soil crust stability (slake tests), and Photography (long-term monitoring options). Includes 50 multi-scale plots (containing 5 (or 7) endemic species, 11 (or 12) non-native species (about 110 species encountered)), 23 plots sampled for soil surface stability, over 200 photos, soil samples for each plot, and saltbush samples for chemical analysis (Jim Herring)
- Data Analysis centered on the following: Spatial models (e.g., cover of various components) with Karl Brown (BRD), Correlations between soil surface stability and observable microbiotic crusts (? 23 plots), Photography management system for long-term monitoring (?), and Provision of data to other researchers
- Collaborative vegetation work with BLM included the following topics: Native and non-native species locations (including endemics), Vegetation mapping/modeling, Correlations between vegetation and OHV and grazing impacts, System for long-term monitoring, and Strategies for future sampling

Geologic Discipline on Gunnison NCA/Mancos Shale: Task Leader – Richard Grauch USGS GD MRP

- Held first coordination meeting of the entire project. Continued discussions with BLM counterparts regarding GGNCA objectives.
- Compiled (1) preliminary database of published material on the Mancos Shale, (2) preliminary database of locations of oil and gas exploration wells that penetrated the Mancos Shale in the upper Colorado River drainage basin, and (3) partial geologic base for the GGNCA and surrounding area.
- Constructed, described, and sampled 6 soil trenches in the Elephant Skin area. Samples have been analyzed for chemistry, paleontology, and mineralogy. Isotopic work confirms that at least most of the S in the sulfates is derived from isotopically light, marine sulfides probably from the Mancos Shale.

- Reconnaissance geologic mapping of the GGNCA combined with the paleontologic work of soil trenches resulted in the recognition of a problem with either earlier mapping or the paleontology. This is probably related to significant differences in geomorphology between the northern and southern portions of the NCA.
- Preliminary Processing of Landsat TM and ASTER data (in progress)
- Field Spectral Transects Started –Limonite cap correlations: increase to North and with higher (older) Terrance Deposits.
- MASTER Flight with 5 meter resolution planned and ordered (Spring 2004).Reconnaissance surface soil sampling of the GGNCA was initiated and preliminary leaching experiments on selected samples were completed. Slope aspect appears to be a significant controlling factor on salinity.

Final Results: ***(****Describe how funds awarded were used to promote Director's goals of integrated science****)***

Project objectives are dynamic and are being refined in cooperation with BLM/NCA staff in response to field results and clarification of management needs. The funds are being expended by researchers in all 4 USGS disciplines. Their work is being conducted in collaboration with managers and scientists from the BLM and scientists from the BOR, Forest Service, and USDA-NRCS.